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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Mitsuhiro KASAHARA et al.

Group Art Unit: 2673

Appl. No. : 09/856,161 (National Stage of PCT/JP00/06212)

Examiner: Not Yet Assigned

Filed : July 31, 2001

: DISPLAY DEVICE AND METHOD OF CONTROLLING ITS BRIGHTNESS

**INFORMATION DISCLOSURE STATEMENT
ALONG WITH DISCUSSION OF THE CITED DOCUMENTS**

Assistant Commissioner of Patents
Washington, DC 20231

Sir :

In accordance with the duty of disclosure under 37 C.F.R. §1.56, §1.97-1.98,

Applicant hereby calls the following documents to the Examiner's attention:

The following documents were noted in a prior art search performed by

Applicants:

- (1) Japanese Laid Open Patent Publication No. HEI 6-282241, which was published on October 7, 1994, along with an English language Abstract of the same;
- (2) Japanese Laid Open Patent Publication No. HEI 9-6283, which was published on January 10, 1997, along with an English language Abstract of the same;
- (3) Japanese Laid Open Patent Publication No. HEI 9-198005, which was published on July 31, 1997, along with an English language Abstract of the same;
- (4) Japanese Laid Open Patent Publication No. HEI 10-215424, which was

published on August 11, 1998, along with an English language Abstract of the same;

- (5) Japanese Laid Open Patent Publication No. HEI 11-194745, which was published on July 21, 1999, along with an English language Abstract of the same; and
- (6) ITE '98: 1998 ITE Annual Convention, along with a partial English language translation of the same.

Applicants also call the following documents, which were cited in an International Search Report, mailed on December 19, 2000 for PCT/JP00/06212, which corresponds to the present National Stage Application. Applicants note that this Search Report was previously submitted with the above-mentioned PCT Application when filing the instant National Stage Application:

- (7) Japanese Laid Open Patent Publication No. HEI 11-288244, which was published on October 19, 1999, was cited as a P-Category document (i.e., a document published prior to the international filing date but later than the priority date claimed) and an X-Category document (i.e., a document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone) with respect to claims 1-3, 5-12 and 14-20 of the PCT application. This document is also cited as a P-Category document and an A-Category document (i.e., a document defining the general state of the art which is not considered to be of particular relevance) with respect to claims 4 and 13 of the PCT application. The Examiner indicated that the full text and Figs. 1-17 are relevant;

(8) Japanese Laid Open Patent Publication No. HEI 11-231828, which was published on August 27, 1999, was cited as an A-Category document with respect to claims 1-20 of the PCT application. The Examiner indicated that the full text and Figs. 1-27 are relevant; and

(9) Japanese Laid Open Patent Publication No. HEI 9-288467, which was published on November 4, 1997, was cited as an A-Category document with respect to claims 1-20 of the PCT application. The Examiner indicated that the full text and Figs. 1-23 are relevant.

Applicants further call to the Examiner's attention a Japanese Office Action (Notification of Reason(s) for Refusal), that was issued on May 7, 2001 for counterpart Japanese Application No. 11-283228, in which the following documents were cited:

(10) Japanese Laid Open Patent Publication No. HEI 11-288244, which is noted above;

(11) Japanese Laid Open Patent Publication No. HEI 11-231828, which is noted above;

(12) Japanese Laid Open Patent Publication No. HEI 11-194745, which is noted above; and

(13) Japanese Laid Open Patent Publication No. HEI 11-212517, which was published on August 6, 1999, along with an English language Abstract of the same.

DISCUSSION OF INSTANT INVENTION AND CITED DOCUMENTS

Applicants herewith provide comments as to the present invention, and at least one difference between the present invention and each cited document. In this regard, Applicants note that document (7) and (10) (e.g., HEI 11-288224) appears to be most closely related to the subject matter of the above-captioned application, as defined by the claims.

The present invention is directed to preventing damage to a display by estimating a temperature estimation value that corresponds to the temperature of a display screen of a display from a video signal; setting a temperature reference value that corresponds to the temperature of an outer periphery of the display; finding a temperature difference estimation value by an operation from the difference between the temperature estimation value and the temperature reference value; and controlling the luminance of an image on the basis of the found temperature difference estimation value. Stress exerted on the display can be detected by calculating the temperature difference estimation value between the reference value (corresponding to the temperature of the outer periphery of the display) and the temperature estimation value (corresponding to the temperature of the display screen). Thus, it is possible to reduce (or prevent) damage to the display.

Document (1) above (HEI 6-282241) discloses an image having a feeling of high luminance without increasing the power consumption by correcting the level of a luminance signal such that the luminance of the center of the screen is HIGH and the

luminance of the periphery of the screen is LOW, and driving a plasma display panel so as to emit light by the corrected video signal. Applicants submit that the present invention is not related to these features.

Document (2) above (HEI 9-6283) discloses detecting the temperature of a display panel or an atmospheric temperature in a device using a temperature detector, to reduce the number of sustain pulses or lower or control a sustain pulse voltage to control a luminance when the temperature exceeds a particular threshold value, to make a temperature compensation. Applicants submit this differs from the present invention.

Document (3) above (HEI 9-198005) discloses means for detecting a temperature in respective heat conduction means in a front panel and a rear panel which constitute a display panel, to control a luminance depending on the temperature difference therebetween.

Document (4) above (HEI 10-215424) discloses restraining a power consumption by finding an amount of current from an average value of a luminance of a video signal and a particular threshold value. Applicants submit that this differs from the present invention.

Document (5) and (12) above (HEI 11-194745) is directed to dividing a display screen into a plurality of blocks, finding a temperature estimation value on the basis of a luminance signal corrected for each of the blocks, and controlling the luminance depending on the found temperature estimation value or on the basis of a difference in the

temperature estimation value between the plurality of blocks. Applicants submit that this differs from their invention.

Document (6) above (ITE '98 article) describes estimating a temperature distribution of a panel from a video signal, and controlling the luminance value of an input signal on the basis of the estimation. Further, the luminance of the input signal is controlled so as to independently control a luminance of a center of the panel and a luminance of a periphery of the panel, to control a temperature of the periphery while keeping the quality of an image at the center. Applicants submit that this differs from their invention.

Document (7) and (10) above (HEI 11-288244) discloses that a thermal strain is prevented from being induced by dividing a display on which a video signal is displayed into a plurality of regions, accumulating average gray scales in the respective regions obtained by the division on a time basis to estimate a temperature for each of the regions, finding a temperature difference for the adjacent regions, and controlling a brightness in the portion so as to be decreased depending on the temperature difference. According to this reference, the temperature estimation values in the regions in the display on which the video signal is displayed are compared with each other. On the other hand, in Applicants' invention, the temperature estimation value corresponding to the temperature of the display screen on which the video signal is displayed is compared with the reference value corresponding to the temperature of the outer periphery of the display on which no

video signal is displayed, in order to control the luminance.

Document (8) and (11) above (HEI 11-231828) discloses that an image is divided into a plurality of regions to calculate a temperature for each of the regions, and driving means controlled by the results of the calculation to prevent the panel from being damaged. Applicants submit that this document does not disclose that the difference between the temperature of the outer periphery of a panel and a set value is used to control a driving means.

Document (9) above (HEI 9-288467) is directed to measuring respective temperatures of a periphery of a display panel, in which a heat generating resistor is set up at the center of the display panel, and heating the periphery of the panel by the heat generating resistor if the temperature of the periphery of the panel is lower than the temperature of the center of the panel, in order to make the temperature of the whole display panel uniform, and thus prevent damage to the display panel. Applicants submit that this differs from their invention.

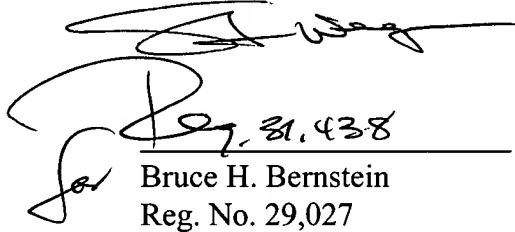
Document (13) above (HEI 11-212517) discloses a display device that changes a combination pattern of a plurality of sub-fields depending on whether an image is a moving image or a still image, when a half-tone display is performed using the sub-fields to restrain the pseudo-contour of the moving image, to ensure gray scale display characteristics. Applicants submit that this is not relevant to their invention.

Applicants respectfully request that the Examiner consider the above materials and

cite the patent documents and enclosed translation and Abstracts. Copies of the above-noted documents are attached and have been listed on a PTO-1449 Form which is also attached hereto. The Examiner is requested to initial the appropriate spaces on the attached PTO-1449 Form and to return a copy of the Form to Applicants with the next official communication in the present application to confirm consideration of these documents.

Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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